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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/678,815	10/06/2003	Peter Joel Meschter	128888	3253

7590 10/06/2004

General Electric Company
CRD Patent Docket Rm 4A59
Bldg. K-1
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EXAMINER	
MCNEIL, JENNIFER C	
ART UNIT	PAPER NUMBER
1775	

DATE MAILED: 10/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/678,815	Applicant(s) MESCHTER ET AL.	
	Examiner Jennifer C McNeil	Art Unit 1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Examiner's Comments

The claims recite the term "majority" with respect to a composition of a layer. As defined in the specification on page 4, line 8, "majority" is considered to be greater than 50% by volume.

Claim Objections

Claim 30 is objected to because of the following informalities: Should claim 30 depend from claim 27 and not 29?. Appropriate correction is required.

Double Patenting

Claim 7 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 4. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 6, 8, 9, 13-19, 21, 23-26, 29-32, 35-37, and 39 are rejected under 35 U.S.C. 102(e) as being anticipated by Spitsberg (US 6,699,607). Spitsberg teaches a thermal barrier coating for silicon containing substrates. The substrate is coated with a bond coat comprising silicon, and a coating thereon of barium aluminate (col. 5, lines 60-65). Regarding claims 14-18, and 31, the substrate may be SiN, SiC, and have fibers dispersed therein, and mixtures thereof. Regarding claim 21, an additional ceramic layer may be deposited over the aluminate. Regarding claims 23, 29, and 30, an intermediate coating may be provided, such as mullite or BSAS. Regarding claim 39, the coating may be applied via plasma spray.

Claims 1, 11-14, 19, 23, 27, 28, 30-34, 36, and 39 are rejected under 35 U.S.C. 102(e) as being anticipated by Lane et al (US 2004/0028941). Lane teaches a protective overlayer for a substrate comprised of silicon. The coating may comprise a bond coat and a layer of rare earth aluminates. Regarding claim 13, a bond coat layer of zircon or yttrium silicate may be provided. Regarding claims 14 and 31, the substrate may be SiC or SiN. Regarding claim 23, additional layers may be provided such as mullite. Regarding claim 39, the layers may be applied via plasma spray.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 11-13, 19, 21, 23, 27, 28, 32, 34, 36, and 39 are rejected under 35 U.S.C. 103(a) as being obvious over Heimberg et al (US 2002/0164430) in view of Wang et al (US 6,299,988). Heimberg teaches an article for use in a turbine engine comprising a substrate, a bond coat, and a thermal barrier comprising lanthanum aluminate. Heimberg teaches a substrate comprising nickel, cobalt, or chromium based superalloys, but does not give additional examples of useful substrate compositions. Wang teaches an article for use in a turbine engine comprising a silicon-containing substrate, a bond coat, and ceramic topcoat. Wang teaches that suitable silicon containing substrates include silicon alloys such as niobium silicon alloys, molybdenum silicon alloys, and the like. As it is clearly taught by Wang that silicon containing metal substrates are used as substrates for turbine engine components, and that these substrates are compatible with coatings like those taught by Heimberg, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a substrate taught by Wang and combined with the protective coating of Heimberg with the full expectation that the article would be functional at the high temperature demands of turbine engines.

Regarding claim 13, Wang teaches bond coats including silicon.

Regarding claim 23, an intermediate layer of lanthanum oxide may be used.

Regarding claim 39, the aluminate layer may be applied via plasma spray.

Claims 1-4, 6-9, 13, 19, 20 23-26, 32, 33, 35, 36, 38, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagaraj et al (US 2004/0115471) in view of Wang et al (US 6,299,988). Nagaraj teaches a thermal barrier coating for a turbine engine component. The thermal barrier coating is applied via a bond coat, and the coating comprises an alkaline earth aluminate. The aluminate may comprise barium or strontium aluminate. Nagaraj teaches a superalloy substrate but does not give additional examples of suitable substrate compositions. Wang teaches an article for use in a turbine engine comprising a silicon-containing substrate, a bond coat, and ceramic topcoat. Wang teaches that suitable silicon containing substrates include silicon alloys such as niobium silicon alloys, molybdenum silicon alloys, and the like. As it is clearly taught by Wang that silicon containing metal substrates are used as substrates for turbine engine components, and that these substrates are compatible with coatings like those taught by Nagaraj, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a substrate taught by Wang and combined with the protective coating of Nagaraj with the full expectation that the article would be functional at the high temperature demands of turbine engines.

Regarding claims 4 and 7, absent a showing of unexpected results, one of ordinary skill in the art at the time of the invention would have found it obvious to use calcium aluminate, as Nagaraj clearly teaches alkaline aluminates.

Regarding claim 13, Wang teaches bond coats including silicon.

Regarding claim 20, Nagaraj teaches that the aluminate may be a mixture of Ba and Sr.

Regarding claim 39, the layers may be deposited via plasma spray.

Claims 1-3, 6, 10, 13, 19, 21-26, 32, 33, and 35-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fleck et al (US 2004/0057832) in view of Wang et al (US 6,299,988). Fleck teaches a turbine blade including a layer comprising 10-95 wt% magnesium aluminate. Fleck teaches a bond coat between the substrate and the aluminate layer. Fleck teaches that the substrate may comprise a superalloy, but does not give additional examples of suitable compositions. Wang teaches an article for use in a turbine engine comprising a silicon-containing substrate, a bond coat, and ceramic topcoat. Wang teaches that suitable silicon containing substrates include silicon alloys such as niobium silicon alloys, molybdenum silicon alloys, and the like. As it is clearly taught by Wang that silicon containing metal substrates are used as substrates for turbine engine components, and that these substrates are compatible with coatings like those taught by Fleck, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a substrate taught by Wang and combined with the protective coating of Fleck with the full expectation that the article would be functional at the high temperature demands of turbine engines.

Regarding claim 13, Wang teaches a bond coat comprising silicon.

Regarding claim 21, additional layer may be provided over the aluminate.

Regarding claim 22, the aluminate layer may comprise two layers.

Regarding claim 23, an additional layer may be provided between the substrate and the aluminate layer.

Regarding claim 39, the layer may be deposited via plasma spray.

Claims 1-7, 13, 19, 21, 23-26, 32, 33, and 36-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beele (US 6,127,048) in view of Wang et al (US 6,299,988). Beele teaches a thermal barrier coating on a turbine substrate wherein the coating may comprise calcium aluminate. Beele teaches that the substrate may comprise a superalloy, but does not give additional examples of suitable compositions. Wang teaches an article for use in a turbine engine comprising a silicon-containing substrate, a bond coat, and ceramic topcoat. Wang teaches that suitable silicon containing substrates include silicon alloys such as niobium silicon alloys, molybdenum silicon alloys, and the like. As it is clearly taught by Wang that silicon containing metal substrates are used as substrates for turbine engine components, and that these substrates are compatible with coatings like those taught by Beele, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a substrate taught by Wang and combined with the protective coating of Beele with the full expectation that the article would be functional at the high temperature demands of turbine engines.

Regarding claim 13, Wang teaches a bond coat comprising silicon.

Regarding claim 21, a topcoat of zirconia may be provided.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer C McNeil whose telephone number is 571-272-1540. The examiner can normally be reached on 9AM-6PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on 571-272-1535. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jennifer McNeil
Primary Examiner